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EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	**PAPER NUMBER**
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	**Application No.** 10/509,520	**Applicant(s)** TAKEDA ET AL.
	Examiner MICHAEL C. COLUCCI	**Art Unit** 2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/28/2004*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 21, 22, 27-30, 36, 37, 42-44, 51, 52, 56, and 57 are rejected under 35 U.S.C. 102(b) as being anticipated by Lazzari; Gianni et al. US 5465302 A (hereinafter Lazzari).

Re claims 21, 29, 36, 44, 52, 56, and 57, Lazzari teaches a method for detecting a target sound (Col. 3 lines 1-6), comprising the steps of:

inputting sounds output from a sound source into plural microphones (Col. 5 lines 5-19);

detecting a phase of a cross-spectrum between sound signals input into the plural microphones (Col. 8 lines 4-10);

detecting an inclination of the phase of the cross-spectrum (Col. 8 lines 4-10) with respect to a frequency due to respective distances from the sound source to the plural microphones (Col. 5 lines 11-31);

based on the inclination, determining whether the sound input into the plural microphones includes the target sound (Col. 5 lines 5-19).

Re claims 22 and 37, Lazzari teaches the method according to Claim 21, wherein the target sound is human speech (Col. 4 lines 47-55).

Re claim 27, 42, and 51, Lazzari teaches the method according to Claim 21, wherein the plural microphones include at least two microphones adapted to be mounted in different positions (Col. 5 lines 5-19).

Re claims 28 and 43, Lazzari teaches the method according to Claim 21, further comprising the step of, based on the inclination, detecting a delay time in signals input into the plural microphones from the sound source (Col. 8 lines 4-10).

Re claim 30, Lazzari teaches the method according to Claim 29, wherein in the step of determining the delay time, a predetermined modal inclination is used to determine the delay time (Col. 8 lines 4-10).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 23-26, 31-35, 38-41, 45-50, 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lazzari; Gianni et al. US 5465302 A (hereinafter Lazzari) in view of Aoki; Mariko et al. US 6130949 A (hereinafter Aoki).

Re claims 23 and 33, Lazzari teaches the method according to Claim 21, further comprising the steps of:

determining whether the sound input into the plural microphones includes the target sound (Col. 5 lines 5-19)

However, Lazzari fails to teach dividing the frequency into a plurality of bands (AokiCol. 3 line 58 – Col. 4 line 6);

detecting the inclination of the phase for each of the plurality of bands (Aoki Col. 3 line 58 – Col. 4 line 6);

based on the detected inclinations of the phase of each of the plurality of bands (Aoki Col. 3 line 58 – Col. 4 line 6),

Aoki teaches a method of detecting a sound source zone comprises providing a plurality of microphones which are located as separated from each other, each microphone providing an output channel signal which is divided into a plurality of frequency bands such that essentially and principally a signal component from a single sound source resides in each band, detecting, for each common band of respective output channel signals, a difference in a parameter such as a level (power) and/or time of arrival (phase) of the acoustic signal reaching each microphone which undergoes a change attributable to the locations of the plurality of microphone, comparing the parameter values thus detected for each band between the channels, and on the basis

of the result of such comparison, determining a zone in which the sound source of the acoustic signal reaching the microphone is located.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention dividing a frequency into a plurality of bands and detecting an inclination in the phase of each band for the purposes of locating where an acoustic signal is located, wherein the power and/or time can be calculated for each band.

Re claims 24 and 39, Lazzari fails to teach the method according to Claim 23, further comprising the steps of:

generating a histogram based on the detected inclinations of the phase of each of the plurality of bands (Aoki Col. 2 lines 16-28);

detecting an incidence from the histogram (Aoki Col. 2 lines 16-28) to determine whether the sound input into the plural microphones includes the target sound (Aoki Col. 3 line 58 – Col. 4 line 6).

Aoki teaches the use of a histogram is effective in detecting a peak among the cross-correlations. However, a histogram formed on a time axis causes a time delay. To provide a histogram without causing a time delay, it is contemplated to divide the signal into bands, and to form a histogram over all the bands.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention generating a histogram to detect inclinations and incidence to find a target sound from a plurality of microphones to allow for the detection of peaks within

a cross correlation relative to time delays, wherein time delays are overcome by a division of the signal into several bands relative to the histogram.

Re claims 25 and 40, Lazzari teaches the method according to Claim 23, further comprising the step of:

detecting the target sound when the detected inclinations of each of the plurality of bands are concentrated near a specific inclination (Col. 5 lines 5-19).

However, Lazzari fails to teach the plurality of bands (Aoki Col. 3 line 58 – Col. 4 line 6)

Aoki teaches a method of detecting a sound source zone comprises providing a plurality of microphones which are located as separated from each other, each microphone providing an output channel signal which is divided into a plurality of frequency bands such that essentially and principally a signal component from a single sound source resides in each band, detecting, for each common band of respective output channel signals, a difference in a parameter such as a level (power) and/or time of arrival (phase) of the acoustic signal reaching each microphone which undergoes a change attributable to the locations of the plurality of microphone, comparing the parameter values thus detected for each band between the channels, and on the basis of the result of such comparison, determining a zone in which the sound source of the acoustic signal reaching the microphone is located.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention dividing a frequency into a plurality of bands for the purposes of

locating where an acoustic signal is located, wherein the power and/or time can be calculated for each band.

Re claims 26, 35, 41, and 50, Lazzari fails to teach the method according to Claim 21, further comprising the steps of:

dividing the sound signals input into the plural microphones (Aoki Col. 3 line 58 – Col. 4 line 6) into predetermined time sections (Aoki Col. 2 lines 16-28) ;

detecting the phase of the cross-spectrum between the sound signals in each time section (Aoki Col. 3 line 58 – Col. 4 line 6).

Aoki teaches a method of detecting a sound source zone comprises providing a plurality of microphones which are located as separated from each other, each microphone providing an output channel signal which is divided into a plurality of frequency bands such that essentially and principally a signal component from a single sound source resides in each band, detecting, for each common band of respective output channel signals, a difference in a parameter such as a level (power) and/or time of arrival (phase) of the acoustic signal reaching each microphone which undergoes a change attributable to the locations of the plurality of microphone, comparing the parameter values thus detected for each band between the channels, and on the basis of the result of such comparison, determining a zone in which the sound source of the acoustic signal reaching the microphone is located.

Aoki teaches the use of a histogram is effective in detecting a peak among the cross-correlations. However, a histogram formed on a time axis causes a time delay.

To provide a histogram without causing a time delay, it is contemplated to divide the signal into bands, and to form a histogram over all the bands.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention dividing a sound signal into time sections and detecting the phase of the cross-spectrum in the time sections to allow for locating where an acoustic signal is located, wherein the power and/or time can be calculated for each band incorporating phase (delay).

Re claims 31, 45, and 46, Lazzari teaches the method according to Claim 29, further comprising the steps of:

based on the determined delay time (Col. 8 lines 4-10), synthesizing the sounds input into the first and second microphones;

determining whether a target sound is present in the synthesized sound signals (Col. 5 lines 5-19).

However, Lazzari fails to teach synthesizing the sounds input into the first and second microphones (Aoki Col. 3 lines 47-57)

Aoki teaches one of the sound sources is a speaker, and at least one of the other sound sources is electro acoustical transducer means which transduces a received signal oncoming from the remote end into an acoustic signal. The sound source signal selection process interrupts components in the band-divided channel signals which belong to the acoustic signal from the electro acoustical transducer means, and selects

components of the voice signal from the speaker. The sound source signal produced in the sound source synthesis process is transmitted to the remote end.

Aoki teaches a method of detecting a sound source zone comprises providing a plurality of microphones which are located as separated from each other, each microphone providing an output channel signal which is divided into a plurality of frequency bands such that essentially and principally a signal component from a single sound source resides in each band, detecting, for each common band of respective output channel signals, a difference in a parameter such as a level (power) and/or time of arrival (phase) of the acoustic signal reaching each microphone which undergoes a change attributable to the locations of the plurality of microphone, comparing the parameter values thus detected for each band between the channels, and on the basis of the result of such comparison, determining a zone in which the sound source of the acoustic signal reaching the microphone is located.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention synthesizing sounds into microphones based on a delay for the purposes of extracting a signal component in each band, wherein signal components can be classified by band.

Re claims 32 and 47, Lazzari teaches the method according to Claim 31, wherein the target sound is human speech (Col. 4 lines 47-55).

Re claims 34 and 49, Lazzari teaches the method according to Claim 33, further comprising the step of:

determining the delay time when the inclinations of each of the plurality of bands are concentrated near a specific inclination (Col. 5 lines 5-19).

However, Lazzari fails to teach a plurality of bands (Aoki Col. 3 line 58 – Col. 4 line 6)

Aoki teaches a method of detecting a sound source zone comprises providing a plurality of microphones which are located as separated from each other, each microphone providing an output channel signal which is divided into a plurality of frequency bands such that essentially and principally a signal component from a single sound source resides in each band, detecting, for each common band of respective output channel signals, a difference in a parameter such as a level (power) and/or time of arrival (phase) of the acoustic signal reaching each microphone which undergoes a change attributable to the locations of the plurality of microphone, comparing the parameter values thus detected for each band between the channels, and on the basis of the result of such comparison, determining a zone in which the sound source of the acoustic signal reaching the microphone is located.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention dividing a frequency into a plurality of bands for the purposes of locating where an acoustic signal is located relative to delay time, wherein the power and/or time can be calculated for each band.

Re claims 38, 48, 53, and 55, Lazzari teaches the sound signal processor according to Claim 36, wherein the inclination detector divides the frequency of the phase of the cross-spectrum (Col. 8 lines 4-10)

However, Lazzari fails to teach a plurality of bands and detects inclinations of each of the plurality of bands, and the target sound detector detects whether the sound input into the plural microphone (Aoki Col. 3 line 58 – Col. 4 line 6 & Fig. 20)

includes the target sound based on the inclinations of each of the plurality of bands detected by the inclination detector (AokiCol. 3 line 58 – Col. 4 line 6)

Aoki teaches a method of detecting a sound source zone comprises providing a plurality of microphones which are located as separated from each other, each microphone providing an output channel signal which is divided into a plurality of frequency bands such that essentially and principally a signal component from a single sound source resides in each band, detecting, for each common band of respective output channel signals, a difference in a parameter such as a level (power) and/or time of arrival (phase) of the acoustic signal reaching each microphone which undergoes a change attributable to the locations of the plurality of microphone, comparing the parameter values thus detected for each band between the channels, and on the basis of the result of such comparison, determining a zone in which the sound source of the acoustic signal reaching the microphone is located.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention dividing a frequency into a plurality of bands and detecting an

inclination in the phase of each band for the purposes of locating where an acoustic signal is located, wherein the power and/or time can be calculated for each band.

Re claims 54, Lazzari teaches voice recognition device for processing a speech sound output from a speech Sound source and input into plural microphones, comprising

a cross-spectrum phase detector for detecting a phase of a cross-spectrum between sound Signals input into the plural microphones (Col. 8 lines 4-10);

an inclination detector for detecting an inclination of the phase of the cross-spectrum detected by the cross-spectrum phase detector (Col. 8 lines 4-10) with respect to a frequency (Col. 5 lines 11-31);

a delay time detector for detecting a delay time in the sound signals input into the plural microphones (Col. 8 lines 4-10) based on the inclination with respect to the frequency detected by the inclination detector (Col. 5 lines 11-31);

a speech sound detector for detecting whether the synthesized sound signals synthesized by the sound signal synthesizer include the speech sound based on the inclination with respect to the frequency detected by the inclination detector (Col. 5 lines 11-31);

a voice recognition processor for performing voice recognition processing of the speech sound detected by the speech sound detector (Col. 5 lines 1-10).

However, Lazzari fails to teach a sound signal synthesizer for synthesizing the sound signals input into the plural microphones based on the delay time detected by the delay time detector (Aoki Col. 3 lines 47-57 & Fig. 20 item 232);

a speech sound detector for detecting whether the synthesized sound signals synthesized by the sound signal synthesizer include the speech sound (Aoki Col. 3 lines 47-57)

Aoki teaches one of the sound sources is a speaker, and at least one of the other sound sources is electro acoustical transducer means which transduces a received signal oncoming from the remote end into an acoustic signal. The sound source signal selection process interrupts components in the band-divided channel signals which belong to the acoustic signal from the electro acoustical transducer means, and selects components of the voice signal from the speaker. The sound source signal produced in the sound source synthesis process is transmitted to the remote end.

Aoki teaches a method of detecting a sound source zone comprises providing a plurality of microphones which are located as separated from each other, each microphone providing an output channel signal which is divided into a plurality of frequency bands such that essentially and principally a signal component from a single sound source resides in each band, detecting, for each common band of respective output channel signals, a difference in a parameter such as a level (power) and/or time of arrival (phase) of the acoustic signal reaching each microphone which undergoes a change attributable to the locations of the plurality of microphone, comparing the parameter values thus detected for each band between the channels, and on the basis

of the result of such comparison, determining a zone in which the sound source of the acoustic signal reaching the microphone is located.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention synthesizing sounds into microphones based on a delay for the purposes of extracting a signal component in each band, wherein signal components can be classified by band.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 20040228215 A1, US 5172597 A,US 6469732 B1, US 6618073 B1, US 4121059 A, US 7035418 B1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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